Clase 69 8 diciembre 2021

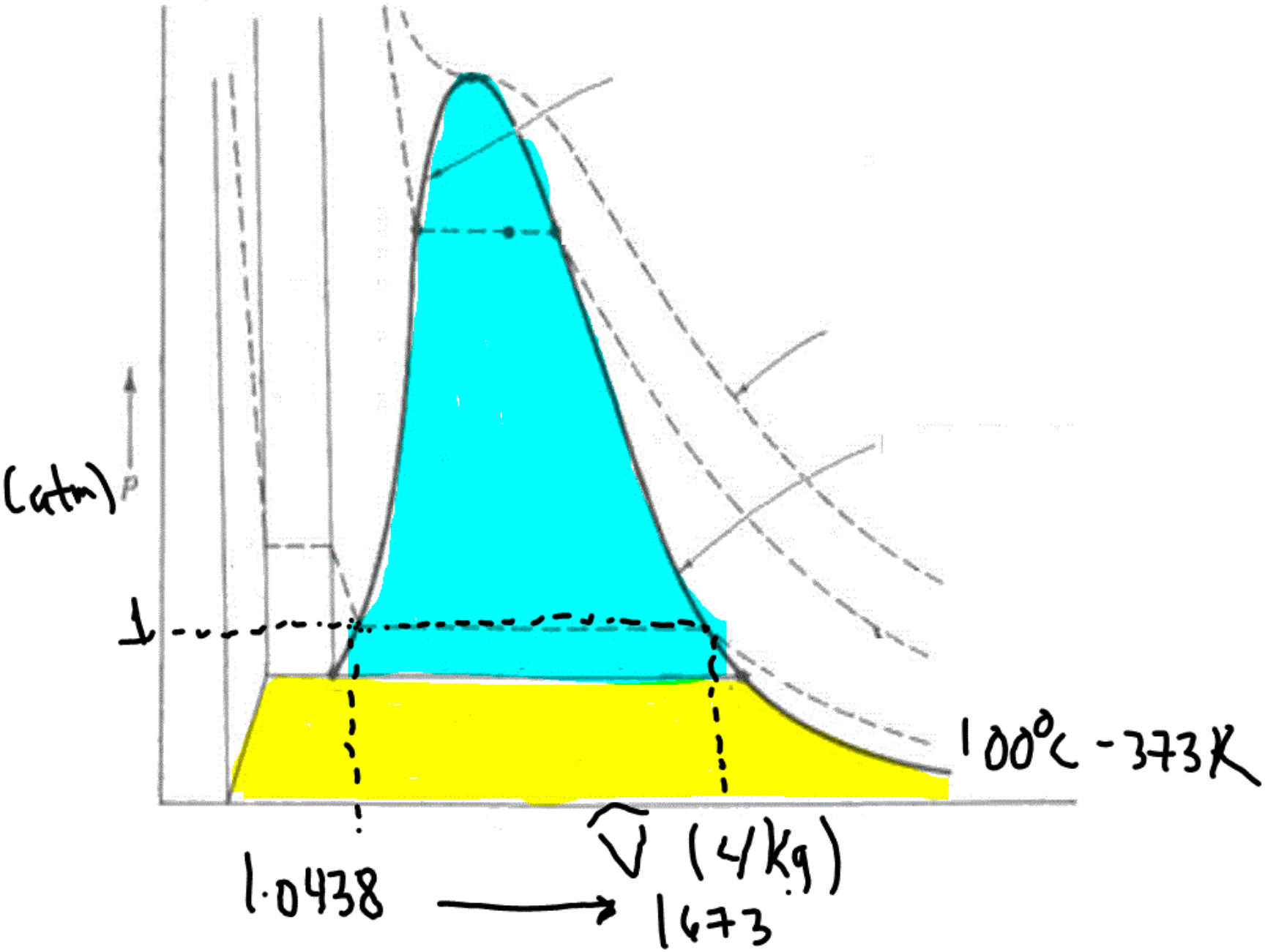
Título de la nota 08/12/2021

sustancia pura eq (L–V)

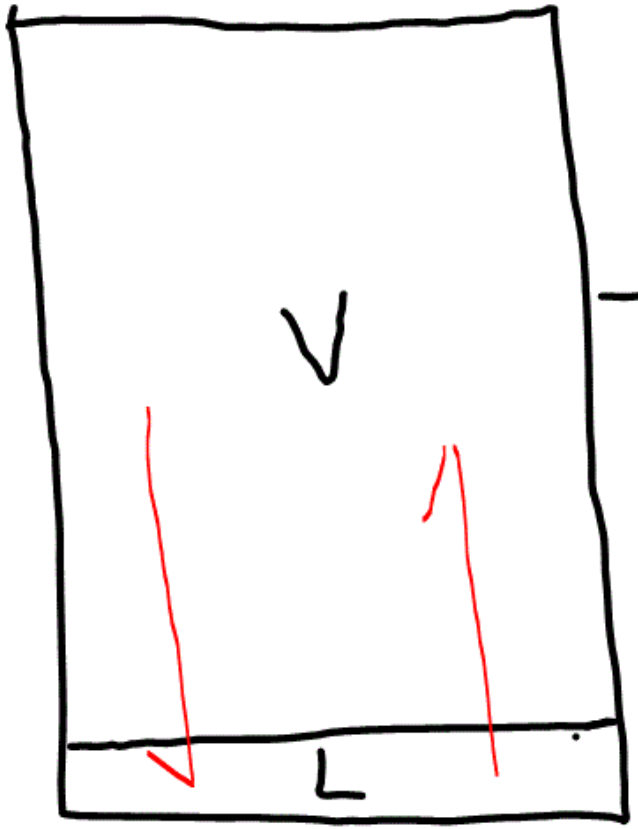
$$y = \frac{n_V}{n_L + n_V} = \frac{n_V}{n_{totales}}$$

$$y = \frac{m_V / M}{m_V / M + m_L / M}$$

$$y = \frac{m_V}{m_V + m_L}$$ Fracción masa


(atm) P
100°C - 373K
$\hat{V}$ (l/kg)
1.0438
1673

1 Kg agua



$V_{Tot} = V_T$

$= 3400\,L$

$T = 80^{\circ}C$

$y = 1$

vaporización total

Tabla I. Propiedades termodinámicas del agua.

Región de dos fases: liquido y vapor saturados									
T	p	Volumen.		U		H		S	
°C	bar	Líquido L/kg	Vapor m³/kg	Líquido kJ/kg	Vapor kJ/kg	Liquido kJ/kg	Vapor kJ/kg	Líquido kJ/kgK	Vapor kJ/kgK
75	0.3855	1.026	4.135	313.7	2474.8	313.74	2634.2	1.0149	7.6794
80	0.4736	1.0293	3.41	334.67	2481	334.72	2642.5	1.0747	7.6088
85	0.578	1.0327	2.829	355.66	2487.2	355.72	2650.7	1.1337	7.5407
90	0.7011	1.0363	2.361	376.68	2493.2	376.75	2658.7	1.192	7.4749
95	0.8453	1.04	1.982	397.71	2499.1	397.8	2666.6	1.2495	7.4114

$$\tilde{V}_T = y\tilde{V}_V + (1-y)\tilde{V}_L$$

$$L/Kg = L/Kg + L/Kg$$

$$\tilde{V}_T = y\tilde{V}_V + (1-y)\tilde{V}_L$$

$$\tilde{V}_T = y\tilde{V}_V + \tilde{V}_L - y\tilde{V}_L$$

$$\tilde{V}_T - \tilde{V}_L = y\tilde{V}_V - y\tilde{V}_L$$

$$\tilde{V}_T - \tilde{V}_L = y(\tilde{V}_V - \tilde{V}_L)$$

$$\tilde{V}_T - \hat{V}_L = y\left(\hat{V}_V - \hat{V}_L\right)$$

$$y = \frac{\tilde{V}_T - \tilde{V}_L}{\hat{V}_V - \hat{V}_L}$$

$$\rho_L \frac{1}{1.0293 \text{ L/Kg}} = 0.97153 \frac{\text{Kg}}{\text{L}}$$

$$= 0.97153 \frac{\text{g}}{\text{cm}^3}$$

$$= 0.97153 \frac{\text{g}}{\text{mL}}$$

$$y = \frac{3400\ L/Kg - 1.02934\ L/kg}{3410\ L/Kg - 1.02934\ L/Kg}$$

$$= 0.99707$$

$$m_v = y m_{total} \quad \therefore \quad m_L = m_{total} - m_v$$

$$m_{total} = 1\ Kg$$

$$m_v = 0.99707\,(1\,kg)$$

$$= 0.99707\,kg$$

$$m_L = m_T - m_v$$

$$= 1\,kg - 0.99707\,kg = 0.00293\,kg$$

$$V_v = m_v \tilde{V}_v \quad \therefore \quad V_L = m_L \tilde{V}_L$$

$$V_v = 0.9970\ \text{kg}\ (3410\ \text{L/kg})$$

$$\simeq 3399.77\ \text{L}$$

$$V_L = 0.00293\ \text{kg}\ (1.0293\ \text{L/kg})$$

$$= 3.01 \times 10^{-3}\ \text{L}$$

$$V_T = V_v + V_L = 3400\ \text{L}$$

$$V_T = 3400\ L$$

$$\bar{V}_T = \frac{3400\ L}{kg}$$

1 kg agua

$$\frac{760\ mmHg}{1.0132\ bar}$$

$$(585\ mmHg)\left(\frac{1.0132\ bar}{760\ mmHg}\right)$$

$$= 0.7799\ bar$$

$$T=\frac{(T_2 - T_1)}{(p_2 - p_1)}(p - p_1)+T_1$$

donde p es el valor a interpolar

$$y = mx + b$$

$$T=\frac{(95-90)^{\circ}C}{(0.8453-0.7011)\,bar}(0.7799-0.7011)\,bar + 90^{\circ}C$$

$$T = 92.7323^{\circ}C$$